UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/759,953	01/16/2004	Kiyoshi Satoh	ASMJP.055DV1	8185

20995 7590 02/24/2009

KNOBBE MARTENS OLSON & BEAR LLP
2040 MAIN STREET
FOURTEENTH FLOOR
IRVINE, CA 92614

EXAMINER	
LUND, JEFFRIE ROBERT	

ART UNIT	PAPER NUMBER
1792	

NOTIFICATION DATE	DELIVERY MODE
02/24/2009	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

jcartee@kmob.com
eOAPilot@kmob.com

UNITED STATES PATENT AND TRADEMARK OFFICE

Commissioner for Patents
United States Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450
www.uspto.gov

BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/759,953
Filing Date: January 16, 2004
Appellant(s): SATOH ET AL.

Adeel S. Akhtar
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed November 19, 2008 appealing from the Office action mailed April 1, 2008.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

5,812,403	Fong et al	9-1998
5,069,938	Lorimer et al	12-1991

6,498,109 B2	Iyer	12-2002
6,450,116 B1	Noble et al	9-2002
6,033,479	Ikeda	3-2000
3,963,214	Hackman et al	6-1976

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-3, 5-6, 8, 9, 15, 16, and 45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fong et al, US Patent 5,812,403, in view of Lorimer et al, US Patent 5,069,938, and Iyer, US Patent 6,498,109 B2.

Fong et al teaches a chemical vapor deposition apparatus comprising: a deposition reaction chamber 200; a plasma discharge chamber 55 that is provided remotely from the reaction chamber and forms a plasma having an activating energy of 500-2500 Watts (column 45 line 47 through column 46 line 67); a source of fluorine containing cleaning gas (NF_3) (column 14 lines 11-31, column 46 line 6) connected to the plasma discharge chamber; piping 47 that links the reaction chamber and the remote plasma discharge chamber; and a gate valve 280 positioned between a remote

plasma chamber 55 and a reaction chamber 200. The valve has an opening sized, when fully opened, substantially equal in width to the inner surface of the piping 47, and does not have projections with respect to the inner surface of the piping. Therefore, the valve, when fully open, defines a pressure drop across the valve of less than about 0.1 Torr. (See figures 3 and 6a) The energy coupled to the remote plasma discharge chamber activates fluorine containing cleaning gas within the plasma discharge chamber, and the activated fluorine species in the cleaning gas are brought into the inside of the reaction chamber through the piping and changes solid substances adhered to the inside of the reaction chamber as a consequence of film formation, to gaseous substances, thereby cleaning the inside of the reaction chamber. (Entire document)

Fong et al differs from the present invention in that Fong et al does not disclose that the remote plasma chamber wall, piping, and valves are made from an anodized aluminum alloy, specifically, fluorine-passivated anodized aluminum; or a radio-frequency (RF) energy source connected to plasma discharge chamber electrodes, the a radio frequency (RF) energy source operates at a frequency between about 300 kHz and about 500 kHz.

Lorimer et al teaches plasma processing components made from a fluorine-passivated anodized aluminum. (Entire document)

Iyer teaches a plasma processing apparatus (see fig. 1) that includes: a remote plasma discharge chamber 12 with oppositely placed electrodes (capacitively coupled), inductive coils (inductively coupled), or a microwave source for forming a plasma

remotely; and an RF power source 28 that supplies 50 watts to 5Kw at a frequency between 10 kHz and 200 MHz (see col. 3-lines 24-60) to the remote plasma chamber. (Entire document)

The motivation for making the remote plasma chamber wall, piping, and valve of Fong et al with a fluorine-passivated aluminum is to provide a corrosion resistant material from which to make the wall, piping, and valve as taught by Lorimer et al. Furthermore, it has been held that: the selection of a known material based on its suitability for its intended use is prima facie obviousness (*Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945)); and reading a list and selecting a known compound to meet known requirements is no more ingenious that selecting the last piece to put in the last opening in a jig-saw puzzle (325 U.S. at 335, 65 USPQ at 301).

The motivation for replacing the microwave plasma source of Fong et al with the plasma discharge electrodes and RF power source of Iyer is to provide an alternate plasma source as taught by Iyer. Furthermore, it has been held that the simple substitution of one known element for another to obtain predictable results is obvious (see *KSR International Co. v. Teleflex Inc.*).

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to: make the remote plasma chamber, pipes and valve of Fong et al out of fluorine-passivated aluminum as taught by Lorimer et al; and replace the microwave plasma source of Fong et al with the plasma discharge electrodes and RF power source of Iyer.

3. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fong et al, Lorimer et al, and Iyer, as applied to claims 1-3, 5-6, 8, 9, 15, 16, and 45 above, and further in view of Ikeda, US Patent 6,033,479.

Fong et al, Lorimer et al, and Iyer differ from the present invention in that they do not teach that the valve and piping are heated to prevent the deposition of the cleaning gas.

Ikeda teaches a heating zone 70 that heats valves and pipes to prevent deposition of the process gas. (Figure 2)

The motivation for heating the pipe and valve of Fong et al, Lorimer et al, and Iyer is to prevent deposition of the cleaning gas as taught by Ikeda.

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to heat the pipe and valve of Fong et al, Lorimer et al, and Iyer, as taught by Ikeda.

4. Claims 14, and 17-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fong et al, Lorimer et al, and Iyer, as applied to claims 1-3, 5-6, 8, 9, 15, 16, and 45 above, and further in view of Noble et al, US Patent 6,450,116 B1.

Fong et al, Lorimer et al, and Iyer differ from the present invention in that they do not teach: the piping between the plasma discharge chamber and the reaction chamber is straight without obstruction and at least ½ inch in diameter; reaction gas inlet and outlet defining a horizontal flow across a substrate surface upon which material is deposited within the reaction chamber; and the piping opens into the reaction chamber downstream of the inlet and upstream of a substrate support configured for supporting a

substrate within the chamber.

Noble et al disclose a remote plasma source 300 connected to the reaction chamber 213 via a straight pipe 360 having a diameter of 1 inch such that the reactive species pass from the remote plasma source to the reaction chamber without obstruction. The pipe 360 opens into the reaction chamber downstream of the inlet 269 and upstream of a substrate support 262 configured for supporting a substrate 100 within the chamber, and the reactive species entering into the reaction chamber 213 from the inlet 275 and passing in a horizontal flow across the substrate 100 in the reaction chamber and being exhausted via 270. (Figures 3A, 3B and its description)

The motivation for making the pipe of Fong et al, Lorimer et al, and Iyer straight without any obstruction and with a diameter of at least ½ an inch in diameter is to provide an alternate arrangement of the reaction chamber and the plasma discharge chamber so that radicals can be efficiently delivered to the reaction chamber as taught by Noble et al.

The motivation for placing the pipe such that a horizontal flow across the substrate is produced in the apparatus of Fong et al, Lorimer et al, and Iyer is to provide an alternate arrangement of the reaction chamber and the plasma processing chamber as taught by Noble et al. Furthermore, it was held that the rearrangement of parts is obvious (see *In re Japikse* 86 USPQ 70).

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to make the pipe of Fong et al, Lorimer et al, and Iyer straight without any obstruction and with a diameter of greater of ½ or an inch as taught by

Noble; and to position the pipe of Fong et al, Lorimer et al, Iyer, and Fong et al such that a horizontal flow across the substrate is produced as taught by Noble et al.

5. If it is determined that generic gate vale described by Fong et al does not teach that the opening of the valve is sized, when fully opened, substantially equal in width to an inner surface of the piping, and the valve does not have projections, when fully opened, with respect to the inner surface of the piping, and thus have a pressure drop of less that 0.1 torr, the following rejections are provided.

6. Claims 1-3, 5-6, 8, 9, 15, 16, and 45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fong et al, US Patent 5,812,403, in view of Lorimer et al, U.S. Patent 5,069,938, Iyer, U.S. Patent 6,498,109 B2, and Hackman et al, US Patent 3,963,214.

Fong et al teaches a chemical vapor deposition apparatus comprising: a deposition reaction chamber 200; a plasma discharge chamber 55 that is provided remotely from the reaction chamber and forms a plasma having an activating energy of 500-2500 Watts (column 45 line 47 through column 46 line 67); a source of fluorine containing cleaning gas (NF_3) (column 14 lines 11-31, column 46 line 6) connected to the plasma discharge chamber; piping 47 that links the reaction chamber and the remote plasma discharge chamber; and a gate valve 280 positioned between a remote plasma chamber 55 and a reaction chamber 200. The energy coupled to the remote plasma discharge chamber activates fluorine containing cleaning gas within the plasma discharge chamber, and the activated fluorine species in the cleaning gas are brought into the inside of the reaction chamber through the piping and changes solid substances

adhered to the inside of the reaction chamber as a consequence of film formation, to gaseous substances, thereby cleaning the inside of the reaction chamber. (Entire document)

Fong et al differs from the present invention in that Fong et al does not disclose that the remote plasma chamber wall, piping, and valves are made from an anodized aluminum alloy, specifically, fluorine-passivated anodized aluminum; a radio-frequency (RF) energy source connected to plasma discharge chamber electrodes, the a radio frequency (RF) energy source operates at a frequency between about 300 kHz and about 500 kHz; or the gate valve has an opening sized, when fully opened, substantially equal in width to the inner surface of the piping, and does not have projections with respect to the inner surface of the piping and defines a pressure drop across the valve of less than about 0.1 Torr.

Lorimer et al teaches plasma processing components made from a fluorine-passivated anodized aluminum. (Entire document)

Iyer teaches a plasma processing apparatus (see fig. 1) that includes: a remote plasma discharge chamber 12 with oppositely placed electrodes (capacitively coupled), inductive coils (inductively coupled), or a microwave source for forming a plasma remotely; and an RF power source 28 that supplies 50 watts to 5Kw at a frequency between 10 kHz and 200 MHz (see col. 3-lines 24-60) to the remote plasma chamber. (Entire document)

Hackman et al teaches a gate valve that is sized, when fully opened, substantially equal in width to an inner surface of the piping, and the valve does not

have projections, when fully opened, with respect to the inner surface of the piping. Thus, the valve has a pressure drop of less than 0.1 torr. (Figures 1 and 4, column 1 lines 18-43)

The motivation for making the remote plasma chamber wall, piping, and valve of Fong et al with a fluorine-passivated aluminum is to provide a corrosion resistant material from which to make the wall, piping, and valve as taught by Lorimer et al. Furthermore, it has been held that: the selection of a known material based on its suitability for its intended use is prima facie obviousness (*Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945)); and reading a list and selecting a known compound to meet known requirements is no more ingenious that selecting the last piece to put in the last opening in a jig-saw puzzle (325 U.S. at 335, 65 USPQ at 301).

The motivation for replacing the microwave plasma source of Fong et al with the plasma discharge electrodes and RF power source of Iyer is to provide an alternate plasma source as taught by Iyer. Furthermore, it has been held that the simple substitution of one known element for another to obtain predictable results is obvious (see *KSR International Co. v. Teleflex Inc.*).

The motivation for replacing the generic gate valve of Fong et al is to provide a specific gate valve as required by Fong et al but only generically described. Fong et al teaches that the gate valve is optional, so one of ordinary skill looking for a specific gate valve for use in the plasma supply line of Fong et al would select a gate valve with little or not pressure drop so that the processing system would not perform any differently than it

would without the valve. Thus, one of ordinary skill would be drawn to gate valves such as Hackman et al in which the passage is completely unobstructed and has little or no pressure drop as taught by Hackman et al (column 1 lines 18-43). Furthermore, it has been held that the simple substitution of one known element for another to obtain predictable results is obvious (see *KSR International Co. v. Teleflex Inc.*).

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to: make the remote plasma chamber, pipes and valve of Fong et al out of fluorine-passivated aluminum as taught by Lorimer et al; replace the microwave plasma source of Fong et al with the plasma discharge electrodes and RF power source of Iyer; replace the generic gate valve of Fong et al with the specific gate valve taught by Hackman et al.

7. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fong et al, Lorimer et al, Iyer, and Hackman et al, as applied to claims 1-3, 5-6, 8, 9, 15, 16, and 45 above, and further in view of Ikeda, US Patent 6,033,479.

Fong et al, Lorimer et al, Iyer, and Hackman et al differ from the present invention in that they do not teach that the valve and piping are heated to prevent the deposition of the cleaning gas.

Ikeda teaches a heating zone 70 that heats valves and pipes to prevent deposition of the process gas. (Figure 2)

The motivation for heating the pipe and valve of Fong et al, Lorimer et al, Iyer, and Hackman et al is to prevent deposition of the cleaning gas as taught by Ikeda.

Therefore it would have been obvious to one of ordinary skill in the art at the time

the invention was made to heat the pipe and valve of Fong et al, Lorimer et al, Iyer, and Hackman et al as taught by Ikeda.

8. Claims 14, and 17-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fong et al, Lorimer et al, and Iyer, and Hackman et al, as applied to claims 1-3, 5-6, 8, 9, 15, 16, and 45 above, and further in view of Noble et al, U.S. Patent 6,450,116 B1.

Fong et al, Lorimer et al, Iyer, and Hackman et al differ from the present invention in that they do not teach: the piping between the plasma discharge chamber and the reaction chamber is straight without obstruction and at least ½ inch in diameter; reaction gas inlet and outlet defining a horizontal flow across a substrate surface upon which material is deposited within the reaction chamber; and the piping opens into the reaction chamber downstream of the inlet and upstream of a substrate support configured for supporting a substrate within the chamber.

Noble et al disclose a remote plasma source 300 connected to the reaction chamber 213 via a straight pipe 360 having a diameter of 1 inch such that the reactive species pass from the remote plasma source to the reaction chamber without obstruction. The pipe 360 opens into the reaction chamber downstream of the inlet 269 and upstream of a substrate support 262 configured for supporting a substrate 100 within the chamber, and the reactive species entering into the reaction chamber 213 from the inlet 275 and passing in a horizontal flow across the substrate 100 in the reaction chamber and being exhausted via 270. (Figures 3A, 3B and its description)

The motivation for making the pipe of Fong et al, Lorimer et al, Iyer, and

Hackman et al, straight without any obstruction and with a diameter of at least ½ an inch in diameter is to provide an alternate arrangement of the reaction chamber and the plasma discharge chamber so that radicals can be efficiently delivered to the reaction chamber as taught by Noble et al.

The motivation for placing the pipe such that a horizontal flow across the substrate is produced in the apparatus of Fong et al, Lorimer et al, Iyer, and Hackman et al is to provide an alternate arrangement of the reaction chamber and the plasma processing chamber as taught by Noble et al. Furthermore, it was held that the rearrangement of parts is obvious (see *In re Japikse* 86 USPQ 70).

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to make the pipe of Fong et al, Lorimer et al, Iyer, and Hackman et al straight without any obstruction and with a diameter of greater of ½ or an inch as taught by Noble; and to position the pipe of Fong et al, Lorimer et al, Iyer, and Hackman et al such that a horizontal flow across the substrate is produced as taught by Noble et al.

(10) Response to Argument

In regard to the argument 1, specifically, "The Examiner Ignores Teachings Aways in the Prior Art", the Examiner disagrees for the following reasons:

1) The Applicant has dismissed the teachings of Fong et al. Fong et al is the primary reference in the rejections of record. Fong et al has been modified by Lorimer et al to add fluorine-passivated aluminum as a material of construction and by Iyer to replace a microwave remote plasma source with a parallel plate remote plasma source.

The Applicant has argued that such a combination ignores the teachings of the art against the use of the claimed flow through valve. However, the rejections do not modify the teachings of Fong et al in regard to the gate valve between the remote plasma source and the processing chamber. Thus, the Applicant is arguing combinations that have not been made.

2) The Applicant is ignoring the "the entire body of technological literature". Applicant cites US Patent 5,788,788 and US Patent Publication 2002/0033183 as teaching valves that restrict the flow of gas from the remote plasma chamber to the processing chamber. The Examiner agrees that these specific patents teach restricting the flow between the remote plasma chamber and the processing chamber. However, this is not the “the entire body of technological literature”. Fong et al is in the field of invention and clearly teaches the claimed valve between the remote plasma chamber and the processing chamber. Applicant has ignored this teaching. Thus the art clearly teaches the claimed valve. In fact, if the claims contained only the limitations currently being argued, the claims would have been rejected under section 102 in view of Fong et al. The Applicant has failed to point out any errors in the combination. The Applicant has only argued that the prior art is different than Fong et al.

3) The Applicant argues that the gate valve of Fong et al is optional and its teachings are vague. Fong et al does teach that the gate valve is optional. However, Fong et al specifically teaches the valve 280 between the processing chamber and the remote plasma source (see figure 3). Furthermore, figure 3 clearly shows no extension into the flow path to create a pressure drop. This is a clear teaching and discloses the

claimed invention.

4) The Applicant argues that flow of Fong et al is restricted by the mixing block. Independent claims 1 and 9 do not limit additional restrictions between the remote plasma source and the processing chambers.

In regard to the argument 2, specifically, “No Positive Reason is Given for Why One of Skill in the Art Would Have Chosen the Specific Valve for the Specific Combination", the Examiner disagrees for the following reasons:

1) In the combination of Fong et al, Lorimer et al, and Iyer, Fong et al teaches a valve positioned in the piping, wherein an opening of the valve is sized, when fully opened, substantially equal in width to an inner surface of the piping, and the valve does not have projections, when fully opened, with respect to the inner surface of the piping (see figures 2, 3, and 6a), and such a valve will have a pressure drop of less than 0.1 Torr. Applicant has failed to point out any structural differences between the valve of Fong et al and the valve of the present invention. Thus, there is no combination because Fong et al teaches the claimed valve and no reason to combine is required. Therefore, the argument is moot.

2) In the combination of Fong et al, Lorimer et al, Iyer, and Hackman et al, one of ordinary skill in the art reading Fong et al would be motivated to find a gate valve. Each gate valve has a specific pressure drop. Fong et al teaches that the gate valve is optional. Therefore, one of ordinary skill looking for a specific gate valve for use in the plasma supply line of Fong et al would select a gate valve with little or not pressure drop so that the processing system would not perform any differently than it would without

the valve. Thus, one of ordinary skill would be drawn to gate valves such as Hackman et al in which the passage is completely unobstructed and has little or no pressure drop as taught by Hackman et al (column 1 lines 18-43). Furthermore, it has been held that the simple substitution of one known element for another to obtain predictable results is obvious (see *KSR International Co. v. Teleflex Inc.*).

In regard to argument 3, specifically, "The Examiner has not Demonstrated that the Claimed Valve is Inherently Taught by FIGs 6A and 3 of Fong", the Examiner disagrees for the following reasons:

1) There is no inherency rejection. Fong et al clearly teaches the claimed valve. Fong et al in figures 2, 3, and 6a clearly show a valve positioned in the piping, wherein an opening of the valve is sized, when fully opened, substantially equal in width to an inner surface of the piping, and the valve does not have projections, when fully opened, with respect to the inner surface of the piping. Thus at a minimum Fong et al clearly teaches the claimed valve. Claim 1 requires a valve having a pressure drop of less than about 0.25 Torr or (0.1 torr in claim 8). These limitations are functional limitations describing the functioning of the valve, specifically, that it has a pressure drop of less than about 0.25 or 0.1 Torr. A sample structure is shown in figure 4b and the only structural limitation is that the valve stem is not in the passageway. Fong et al teaches the same structural limitation in that no valve is shown extending into the flow passage 293 in figures 2, 3, and 6a. Furthermore, it has been held that: claims directed to apparatus must be distinguished from the prior art in terms of structure rather than function. *In re Danley*, 120 USPQ 528, 531, (CCPQ 1959); "Apparatus claims cover

what a device is, not what a device does" (Emphasis in original) *Hewlett-Packard Co. V. Bausch & Lomb Inc.*, 15 USPQ2d 1525, 1528 (Fed. Cir. 1990); and a claim containing a "recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus "if the prior art apparatus teaches all the structural limitations of the claim *Ex parte Masham*, 2 USPQ2d 1647 (Bd. Pat. App. & Inter. 1987). Also see MPEP 2114. Thus Fong et al teaches the same structural limitations of the claimed valve and is capable of functioning as claimed i.e. having a pressure drop of less than about 0.25 or 0.1 Torr.

2) Applicant has argued that Fong et al does not have a "clear disclosure of a valve body, how it works, or where the valve body is located when the valve is opened", the Examiner disagrees. The valve 280 is shown open in figures 3 and 6a, and the absence of the valve body is not because it is not drawn as argued, but because it is not seen or is fully retracted out of the flow path when the valve is opened as claimed. Thus Fong et al teaches the claimed valve. Looking at figure 6a, if the valve was drawn closed, the valve stem would be pushed in and valve body would be blocking the flow path. (See attached figure)

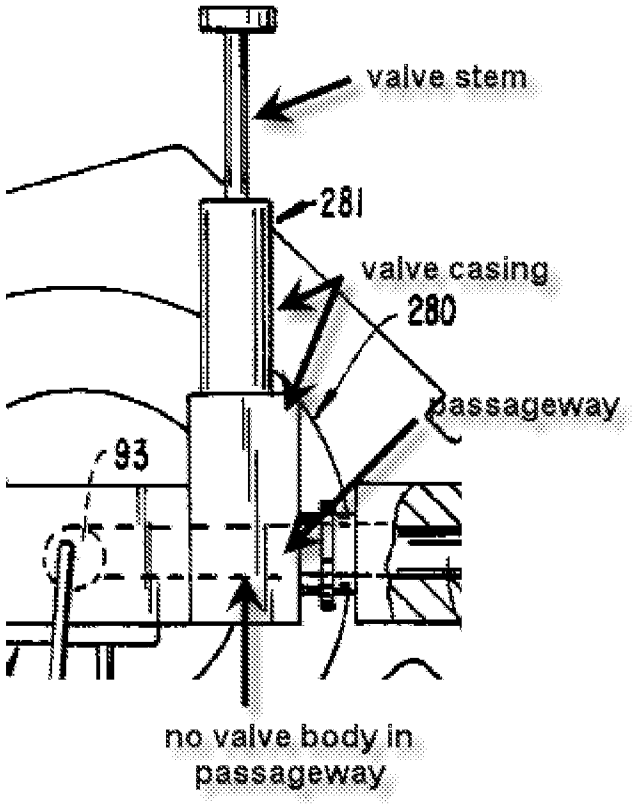


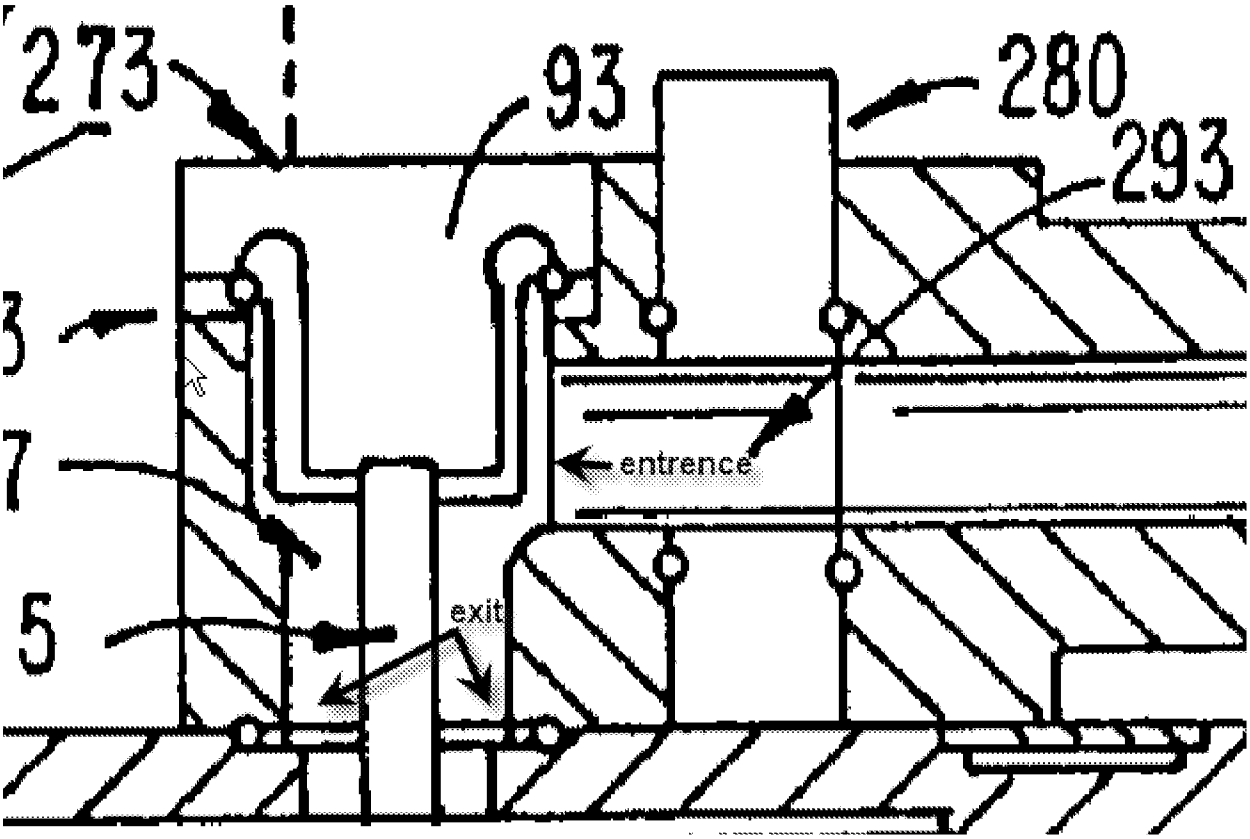
FIGURE 6A

In regard to argument E, specifically, "The Elements Recited in Claim 19 are a Nonobvious Combination", the Examiner disagrees for the following reasons.

1) Applicant is correct in that Noble et al teaches there should be no obstruction between the remote plasma chamber and the processing chamber. Figure 6 of Noble et al is not a schematically depicts a generic passage between two chambers. It specifically shows a passage without obstruction. Applicant has not pointed out any specific teaching that would exclude a valve and support the claim of teaching against adding a valve. Furthermore, the combination does not add a valve to the apparatus of

Noble et al but moves the cleaning gas inlet of Fong et al as taught by Noble et al.

2) There is no evidence that the mixing box of Fong et al is an obstruction of the flow. The inlet of the mixing box is the same as the end of the cleaning gas supply passage and appears to be equal to or smaller than the total outlet area of the mixing box. Furthermore, Fong et al does not teach restricting the flow of the cleaning gas in the mixing box. See attached figure 3.



3) The combination does not suggest removing the mixing box as suggested by the Applicant. The combination is merely rearranging the location of cleaning gas supply line. Thus the mixing box, “a valuable and highly relevant part” is not removed.

4) In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections

are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.,* 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/Jeffrie R. Lund/

Primary Examiner, Art Unit 1792

Conferees:

/Parviz Hassanzadeh/

Supervisory Patent Examiner, Art Unit 1792

/Gregory L Mills/

Supervisory Patent Examiner, Art Unit 1700